PATENT
Attorney Docket No.: 740756-000945

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:	)	
SHINOHARA et al.	)	Group Art Unit: 1762
Application No. 08/169,127	)	
Filed: December 20, 1993	)	Examiner: Marianne Padgett
For: METHOD AND SYSTEM OF LASER PROCESSING	)))	Confirmation No.: 2677

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APPEAL BRIEF

The following is presented in furtherance of the appeal proceedings instituted by the Notice of Appeal filed November 19, 2004, in response to the Final Office Action mailed May 19, 2004 and Advisory Acton mailed May 25, 2005 in connection with the above-identified application.

In accordance with the provisions of 35 U.S.C. §134 and 37 C.F.R. §1.192(a), Appellant submits this appeal brief in triplicate concurrently with a Second Supplemental Amendment to cancel a number of claims to overcome the pending rejections and to reduce the number of issue on appeal.

The Commissioner is hereby authorized to charge the requisite fee of $330 to Deposit Account No 19-2380 (740756-945). If this payment is in any way deficient, of if any other fees are needed to perfect the filing of this brief, or to prosecute this appeal, the Commissioner is hereby authorized to charge Deposit Account No 19-2380 (740756-945) for the balance of any such fees due.

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Real Party in Interest:

The real party in interest is the assignee, Semiconductor Energy Laboratory Co., Ltd, of Kanagawa-ken, Japan.

Related Appeals and Interferences:

There are no related appeals or interferences.

Status of Claims:

As indicated in the Advisory Action mailed May 25, 2005, claims 1-4, 6-9, 18-22, 110-111 and 132-135 have been finally rejected, claims 11-13, 17, 20-60, 63, 65, 68, 70, 73, 75, 78, 80, 83, 85, 88, 90, 97-100, 112-130 and 136-139 have been withdrawn, claims 61-62, 64, 66-67, 69, 71-72, 74, 76-77, 79, 81-82, 84, 86-87, 89, 91-96, 101-109 and 131 are found potentially allowable. By a Supplemental Amendment filed simultaneously herewith, rejected claims 1-4, 6-9, 18-22, 110-111 and 132-135 and withdrawn claims 11-13, 17, 20-60, 97-100, 112-130 and 136-139 are canceled. As a result, only allowed claims 61-62, 64, 66-67, 69, 71-72, 74, 76-77, 79, 81-82, 84, 86-87, 89, 91-96, 101-109 and 131 remain pending in the instant application, as well as withdrawn claims 63, 65, 68, 70, 73, 78, 80, 83, 85, 88 and 90.

Status of Amendments:

The Amendment filed April 28, 2005 has been entered and, based on the Advisory Action mailed May 25, 2005, the Examiner has provided that the this reply has overcome the overcome the formality rejection under §112 (first paragraph) of claims 61-96 and 101-109, the rejection under §112 (second paragraph) of claims 20-22, 134-135, the prior art rejection under §103(a) based on Hongo et al. (JP 57-094482A), thus, reducing the remaining issues on Appeal provided in detail below.

Standing rejections include the judicially created doctrine of obviousness-type double patenting rejection of claims 1-4, 6-9, 18-22, 110-111 and 132-135 over U.S. Patent Nos. 4,786,358 (Yamazaki et al.) in view of Hongo et al. (JP 57-94482) and Nishimura et al., and the judicially created doctrine of obviousness-type double patenting of claims 1-4, 6-9, 18-22, 110-111 and 132-135 over U.S. Patent No. 6,149,988 (Shinohara et al.), and the §112 (second paragraph) of claim 19.

A Supplemental Amendment is filed concurrently with this Appeal Brief to render moot these remaining pending rejections, thereby eliminating all pending issues on appeal.

Summary of Invention:

The presently claimed invention, as shown in Fig. 1, relates to a method of manufacturing an active matrix display having active matrix circuit and a driving circuit for driving a liquid crystal device, disclosed on, e.g., page 12, lines 22-23 of the present specification, and in the descriptions of Figs. 7A-7D. The method includes forming an ion blocking film over a substrate, forming a semiconductor layer comprising amorphous silicon over the ion blocking film. The method further including treating the active matrix with a laser with a controlled beam shape, as shown in, e.g., Figs. 2B, 2C and 2D, including the steps of providing a laser beam having a first cross section, expanding the first cross section in a first direction, condensing the expanded laser beam in a second direction orthogonal to the first direction, irradiating the semiconductor layer with the condensed laser beam having a second cross section at a surface of the semiconductor layer wherein a length of the second cross section in the first direction is longer than that of the first cross section and a width of the second cross section in the second direction is smaller than that of the first cross section, moving the substrate along a third direction orthogonal to the first direction so that the semiconductor layer is scanned with the condensed laser beam to crystallize the semiconductor layer, and forming a plurality of TFTs using the crystallized semiconductor layer as at least channel regions of the TFTs.

Issues:

A. Whether claim 19 is properly rejected under 35 U.S.C. 112, second paragraph, for being indefinite.

B. Whether claims 1-4, 6-9, 18-22, 110-111, and 132-135 are properly rejected under the judicially created doctrine of obviousness-type double patenting over U.S. Patent No. 4,786,358 in view of Hongo (JP 57-94482) and Nishimura et al.

C. Whether claims 1-4, 6-9, 18-22, 110-111, and 132-135 are properly rejected under the judicially created doctrine of obviousness-type double patenting over U.S. Patent No. 6,149,988.

Grouping of Claims:

Claims 61-62, 64, 66-67, 69, 71-72, 74, 76-77, 79, 81-82, 84, 86-87, 89, 91-96, 101-109 and 131, as well as withdrawn claims 63, 65, 68, 70, 73, 75, 78, 80, 83, 85 and 88 stand or fall together.

Arguments:

A. Whether claim 19 is properly rejected under 35 U.S.C. 112, second paragraph, for being indefinite.

Appellant has canceled claim 19 in the Supplemental Amendment filed simultaneously herewith rendering this remaining aspect of this rejection moot.

B. Whether claims 1-4, 6-9, 18-22, 110-111, and 132-135 are properly rejected under the judicially created doctrine of obviousness-type double patenting over U.S. Patent No. 4,786,358 in view of Hongo (JP 57-94482) and Nishimura et al.

Appellants have canceled claims 1-4, 6-9, 18-22, 110-111, and 132-135 have been canceled in the Supplemental Amendment filed simultaneously herewith rendering this rejection moot.

C. Whether claims 1-4, 6-9, 18-22, 110-111, and 132-135 are properly rejected under the judicially created doctrine of obviousness-type double patenting over U.S. Patent No. 6,149,988.

Appellants have canceled claims 1-4, 6-9, 18-22, 110-111, and 132-135 have been canceled in the Supplemental Amendment filed simultaneously herewith rendering this rejection moot.

D. Claims 61-62, 64, 66-67, 69, 71-72, 74, 76-77, 79, 81-82, 84, 86-87, 89, 91-96, 101-109 and 131, as well as withdrawn claims 63, 65, 68, 70, 73, 75, 78, 80, 83, 85, 88 and 90, are now in a condition for allowance.

All prior rejections of claims 61-62, 64, 66-67, 69, 71-72, 74, 76-77, 79, 81-82, 84, 86-87, 89, 91-96, 101-109 and 131 have been overcome as indicated in the Advisory Action

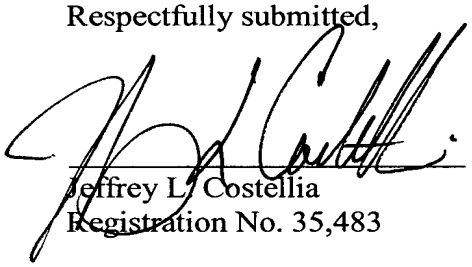
mailed May 25, 2005. Consequently, there are no longer any further issues upon which an appeal is necessary based on the rejections of record. As a result, the instant application should now be in a condition for allowance.

Further, withdrawn claims 63, 65, 68, 70, 73, 75, 78, 80, 83, 85, 88 and 90 depend from claims 61, 66, 71, 76, 81, and 86, respectively, and recite that the ion blocking film comprises silicon oxide or non-doped silicon oxide. These claims should be rejoined with the allowed claims since they have the same priority date as the allowed base claims, namely, December 20, 2003, as provided by Appellants in the response filed November 1, 2002.

Conclusion:

In view of the canceling of claims 1-4, 6-9, 18-22, 110-111 and 132-135 to render the double patenting rejections moot, and in view of the canceling of withdrawn claims 11-13, 17, 20-60, 97-100, 112-130 and 136-139, all pending rejections have been overcome. The Board is respectfully requested to reverse the Examiner's refusal to pass this application to issuance.

Respectfully submitted,



Jeffrey L. Costellia
Registration No. 35,483

NIXON PEABODY LLP
401 9th Street, N.W.
Suite 900
Washington, DC 20004-2128
Telephone: (202) 585-8000
Facsimile: (202) 585-8080

APPENDIX A

Claims Involved in the Appeal

1.-60. (Cancelled)

61. (Previously presented) A method of manufacturing an active matrix display device having an active matrix circuit and a driving circuit, said method comprising:

forming an ion blocking film over a substrate;

forming a semiconductor layer comprising amorphous silicon over said ion blocking film to a thickness of 200 - 1500 Å;

providing a first laser beam having a first cross section;

expanding said first cross section of the first pulsed laser beam in a first direction;

condensing the expanded laser beam in a second direction orthogonal to said first direction;

irradiating the semiconductor layer with the condensed laser beam having a second cross section at a surface of the semiconductor layer wherein a length of said second cross section in said first direction is longer than that of said first cross section and a width of said second cross section in said second direction is smaller than that of said first cross section;

moving said substrate along a third direction orthogonal to said first direction so that the semiconductor layer is scanned with the condensed laser beam and whereby the semiconductor layer is crystallized; and

forming a plurality of thin film transistors using the crystallized semiconductor layer as at least channel regions of the thin film transistors,

wherein both of the active matrix circuit and said driving circuit include said thin film transistors.

62. (Previously presented) The method according to claim 61 wherein said laser beam is an excimer laser beam.

63. (Withdrawn) The method according to claim 61 wherein said ion blocking film comprises silicon oxide.

64. (Previously presented) The method according to claim 61 wherein said blocking film comprises silicon nitride.

65. (Withdrawn) The method according to claim 61 wherein said ion blocking film comprises non-doped silicon oxide.

66. (Previously presented) A method of manufacturing an active matrix display device having an active matrix circuit and a driving circuit, said method comprising:

forming an ion blocking film over a substrate to a thickness of 1000 - 4000 Å;

forming a semiconductor layer comprising amorphous silicon over said ion blocking film to a thickness of 200 - 1500 Å;

providing a first laser beam having a first cross section;

expanding said first cross section of the first pulsed laser beam in a first direction;

condensing the expanded laser beam in a second direction orthogonal to said first direction;

irradiating the semiconductor layer with the condensed laser beam having a second cross section at a surface of the semiconductor layer wherein a length of said second cross section in said first direction is longer than that of said first cross section and a width of said second cross section in said second direction is smaller than that of said first cross section;

moving said substrate along a third direction orthogonal to said first direction so that the semiconductor layer is scanned with the condensed laser beam and whereby the semiconductor layer is crystallized; and

forming a plurality of thin film transistors using the crystallized semiconductor layer as at least channel regions of the thin film transistors,

wherein both of the active matrix circuit and said driving circuit include said thin film transistors.

67. (Previously presented) The method according to claim 66 wherein said laser beam is an excimer laser beam.

68. (Withdrawn) The method according to claim 66 wherein said ion blocking film comprises silicon oxide.

69. (Previously presented) The method according to claim 66 wherein said blocking film comprises silicon nitride.

70. (Withdrawn) The method according to claim 66 wherein said ion blocking film comprises non-doped silicon oxide.

71. (Previously presented) A method of manufacturing an active matrix display device having an active matrix circuit and a driving circuit, said method comprising:

forming an ion blocking film over a substrate;

forming a semiconductor layer comprising amorphous silicon over said ion blocking film to a thickness of 200 - 1500 Å;

providing a first laser beam having a first cross section wherein said laser beam is a pulsed laser beam having a wavelength of not longer than 400 nm;

expanding said first cross section of the first pulsed laser beam in a first direction;

condensing the expanded laser beam in a second direction orthogonal to said first direction;

irradiating the semiconductor layer with the condensed laser beam having a second cross section at a surface of the semiconductor layer wherein a length of said second cross section in said first direction is longer than that of said first cross section and a width of said second cross section in said second direction is smaller than that of said first cross section;

moving said substrate along a third direction orthogonal to said first direction so that the semiconductor layer is scanned with the condensed laser beam and whereby the semiconductor layer is crystallized; and

forming a plurality of thin film transistors using the crystallized semiconductor layer as at least channel regions of the thin film transistors,

wherein both of the active matrix circuit and said driving circuit include said thin film transistors.

72. (Previously presented) The method according to claim 71 wherein said laser beam is an excimer laser beam.

73. (Withdrawn) The method according to claim 71 therein said ion blocking film comprises silicon oxide.

74. (Previously presented) The method according to claim 71 wherein said blocking film comprises silicon nitride.

75. (Withdrawn) The method according to claim 71 wherein said ion blocking film comprises non-doped silicon oxide.

76. (Previously presented) A method of manufacturing an active matrix display device having an active matrix circuit and a driving circuit, said method comprising:

forming an ion blocking film over a glass substrate containing alkali ions;

forming a semiconductor layer comprising amorphous silicon over said ion blocking film to a thickness of 200 - 1500 Å;

providing a first laser beam having a first cross section;

expanding said first cross section of the first pulsed laser beam in a first direction;

condensing the expanded laser beam in a second direction orthogonal to said first direction;

irradiating the semiconductor layer with the condensed laser beam having a second cross section at a surface of the semiconductor layer wherein a length of said second cross section in said first direction is longer than that of said first cross section and a width of said second cross section in said second direction is smaller than that of said first cross section;

moving said substrate along a third direction orthogonal to said first direction so that the semiconductor layer is scanned with the condensed laser beam and whereby the semiconductor layer is crystallized; and

forming a plurality of thin film transistors using the crystallized semiconductor layer as at least channel regions of the thin film transistors,

wherein both of the active matrix circuit and said driving circuit include said thin film transistors.

77. (Previously presented) The method according to claim 76 wherein said laser beam is an excimer laser beam.

78. (Withdrawn) The method according to claim 76 wherein said ion blocking film comprises silicon oxide.

79. (Previously presented) The method according to claim 76 wherein said blocking film comprises silicon nitride.

80. (Withdrawn) The method according to claim 76 wherein said ion blocking film comprises non-doped silicon oxide.

81. (Previously presented) A method of manufacturing an active matrix display device having an active matrix circuit and a driving circuit, said method comprising:

forming an ion blocking film over a glass substrate containing alkali ions to a thickness of 1000 - 4000 Å;

forming a semiconductor layer comprising amorphous silicon over said ion blocking film to a thickness of 200 - 1500 Å;

providing a first laser beam having a first cross section;

expanding said first cross section of the first pulsed laser beam in a first direction;

condensing the expanded laser beam in a second direction orthogonal to said first direction;

irradiating the semiconductor layer with the condensed laser beam having a second cross section at a surface of the semiconductor layer wherein a length of said second cross section in said first direction is longer than that of said first cross section and a width of said second cross section in said second direction is smaller than that of said first cross section;

moving said substrate along a third direction orthogonal to said first direction so that the semiconductor layer is scanned with the condensed laser beam and whereby the semiconductor layer is crystallized; and

forming a plurality of thin film transistors using the crystallized semiconductor layer as at least channel regions of the thin film transistors,

wherein both of the active matrix circuit and said driving circuit include said thin film transistors.

82. (Previously presented) The method according to claim 81 wherein said laser beam is an excimer laser beam.

83. (Withdrawn) The method according to claim 81 wherein said ion blocking film comprises silicon oxide.

84. (Previously presented) The method according to claim 81 wherein said blocking film comprises silicon nitride.

85. (Withdrawn) The method according to claim 81 wherein said ion blocking film comprises non-doped silicon oxide.

86. (Previously presented) A method of manufacturing an active matrix display device having an active matrix circuit and a driving circuit, said method comprising:

forming an ion blocking film over a glass substrate containing alkali ions;

forming a semiconductor layer comprising amorphous silicon over said ion blocking film to a thickness of 200 - 1500 Å;

providing a first laser beam having a first cross section wherein said laser beam is a pulsed laser beam having a wavelength of not longer than 400 nm;

expanding said first cross section of the first pulsed laser beam in a first direction;

condensing the expanded laser beam in a second direction orthogonal to said first direction;

irradiating the semiconductor layer with the condensed laser beam having a second cross section at a surface of the semiconductor layer wherein a length of said second cross section in said first direction is longer than that of said first cross section and a width of said second cross section in said second direction is smaller than that of said first cross section;

moving said substrate along a third direction orthogonal to said first direction so that the semiconductor layer is scanned with the condensed laser beam and whereby the semiconductor layer is crystallized; and

forming a plurality of thin film transistors using the crystallized semiconductor layer as at least channel regions of the thin film transistors,

wherein both of the active matrix circuit and said driving circuit include said thin film transistors.

87. (Previously presented) The method according to claim 86 wherein said laser beam is an excimer laser beam.

88. (Withdrawn) The method according to claim 86 wherein said ion blocking film comprises silicon oxide.

89. (Previously presented) The method according to claim 86 wherein said blocking film comprises silicon nitride.

90. (Withdrawn) The method according to claim 86 wherein said ion blocking film comprises non-doped silicon oxide.

91. (Previously presented) The method according to claim 61 further comprising a step of removing a peripheral portion of the expanded laser beam through a mask before the step of condensing the expanded laser beam wherein said peripheral portion includes at least edges of the expanded laser beam extending in said first direction.

92. (Previously presented) The method according to claim 66 further comprising a step of removing a peripheral portion of the expanded laser beam through a mask before the step of condensing the expanded laser beam wherein said peripheral portion includes at least edges of the expanded laser beam extending in said first direction.

93. (Previously presented) The method according to claim 71 further comprising a step of removing a peripheral portion of the expanded laser beam through a mask before the step of condensing the expanded laser beam wherein said peripheral portion includes at least edges of the expanded laser beam extending in said first direction.

94. (Previously presented) The method according to claim 76 further comprising a step of removing a peripheral portion of the expanded laser beam through a mask before the step of condensing the expanded laser beam wherein said peripheral portion includes at least edges of the expanded laser beam extending in said first direction.

95. (Previously presented) The method according to claim 81 further comprising a step of removing a peripheral portion of the expanded laser beam through a mask before the step of condensing the expanded laser beam wherein said peripheral portion includes at least edges of the expanded laser beam extending in said first direction.

96. (Previously presented) The method according to claim 86 further comprising a step of removing a peripheral portion of the expanded laser beam through a mask before the

step of condensing the expanded laser beam wherein said peripheral portion includes at least edges of the expanded laser beam extending in said first direction.

97. -100. (Cancelled)

101. (Withdrawn) The method according to claim 76 wherein said glass substrate is a soda-lime glass.

102. (Previously presented) The method according to claim 81 wherein said glass substrate is a soda-lime glass.

103. (Previously presented) The method according to claim 86 wherein said glass substrate is a soda-lime glass.

104. (Previously presented) The method according to claim 61 wherein said active matrix display device is a liquid crystal device.

105. (Previously presented) The method according to claim 66 wherein said active matrix display device is a liquid crystal device.

106. (Previously presented) The method according to claim 71 wherein said active matrix display device is a liquid crystal device.

107. (Previously presented) The method according to claim 76 wherein said active matrix display device is a liquid crystal device.

108 (Previously presented) The method according to claim 81 wherein said active matrix display device is a liquid crystal device.

109. (Previously presented) The method according to claim 86 wherein said active matrix display device is a liquid crystal device.

110. -130. (Cancelled)

131. (Previously presented) The method according to claim 61 wherein said laser beam is a pulsed laser beam and said substrate is moved in a stepwise manner.

132. -139. (Cancelled)